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TS# 203099/749  
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Introduction

This memorandum presents a selection of targets which might be considered under an intensified bombing effort against North Vietnam -- in effect, a program not limited as to target areas or size of conventional attack. The potential impact of "unlimited bombing" is a question which CIA has studied frequently during the past seven years. While we have in that time identified a number of targets which have seemed to us to have potential for greatly aggravating Hanoi's economic and military support problems, we have never become convinced that any single target system or combination of targets would of itself, if nullified, destroy North Vietnam's will to persist in seeking its military and political objectives in South Vietnam.

In our memorandum of 22 August, intended to evaluate the air campaign thus far, we recommended that a greater effort be concentrated against North Vietnam's transportation facilities in the northern portion of the country, including those in the now restricted buffer zone along the PRC border. A second conclusion of the 22 August memorandum was that the targeting of North Vietnam's

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industry seemed optimum and that it is doubtful that the overall objectives of the program would be served by more intensive (or extensive) bombing of such facilities in the future. We hold to this position insofar as such bombing might be expected to have any fundamental impact on North Vietnam's war-making capability or ability to sustain its economic viability. However, we recognize that heavy additional bombing of some of the major industrial facilities could further aggravate the import problem and, in addition, might have a certain psychological impact by providing North Vietnam's leaders with additional dramatic proof of US resolve.

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## Transportation

### Introduction

Thus far in the air campaign, a relatively small number of sorties have been flown against transportation targets in northern North Vietnam and none in the 25-mile buffer zone adjacent to the Chinese border. The North Vietnamese have taken advantage of this to continue to move large volumes of supplies, mainly by rail and road from the PRC.

The following sections discuss the potential transportation targets in the buffer zone which, if destroyed or interdicted, would complicate Hanoi's import situation. Two notes of caution are in order, however: First, the enemy's ingenuity in countering even the most well-conceived interdiction program is an established reality of the Vietnam war. Targeting transportation near the PRC border would hit the system at its most vulnerable point but would almost certainly be followed by an elaborate system of countermeasures, such as a proliferation of roads and rapid rail repairs. Secondly, aircraft operating in northern North Vietnam face a serious air defense threat. Currently, there are 23 SAM battalions operating north of 20°, most of them clustered in the Hanoi-Haiphong area. Operations would also be endangered by MIGs operating out of Kep, Phuc Yen, and Kien An airfields. Near the border, SAM

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coverage is less dense, but it still would be a high-threat activity.\*

### Railroads

#### The Northeast Line

On this key import line, the rail yard nearest the China border -- and within the buffer zone -- is at Dong Dang. It has been an active yard in the forwarding of supplies from the PRC into North Vietnam. The maximum number of freight cars observed in photography at Dong Dang since the mining began was 144 cars on 30 July. The overall average of freight cars seen at Dong Dang on 11 days between 7 June and 11 September was about 90 cars.

If the Dong Dang rail yard were interdicted, rail movement toward North Vietnam would cease at P'ing-hsiang (across the border in the PRC), and transshipment of commodities would have to take place at this point or at points farther north in China. Some congestion might develop initially in rail-to-road transshipping areas, but this would not present an insurmountable problem. So long as a sanctuary area exists across the border at P'ing-hsiang, interdiction of the Dong Dang rail yard would not be a crucial impediment to the Communists' supply effort.

\* In mid-July, two SAM battalions were stationed close to Dong Dang (within the 25-mile buffer zone with China) but were subsequently removed, probably because no attacks have occurred there.

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Some damage to rolling stock could be inflicted at Dong Dang. The number of vehicles stored in and around Dong Dang has varied from a high of over 1,500 on 6-7 June to a low of 750 on 14 September. If the Dong Dang vehicle storage areas were destroyed, the Communists might be somewhat hard-pressed initially if they had to rely only on storage areas north of the border. However, vehicles could be stored along roads and in other unused areas relatively easily. The actual loss of perhaps 500 to 1,000 trucks stored at Dong Dang in an initial attack would be a blow to the North Vietnamese, but this loss could soon be made up by additional imports from China or the Soviet Union.

#### The Northwest Line

The other import rail line into North Vietnam goes from the border area at Lao Cai to Hanoi. Traffic at Lao Cai during 12 May-12 September averaged some 45 freight cars per day, of which about three-quarters were boxcars. On 23 June, 85 freight cars were observed in this yard. Since 1 September, 60 to 80 freight cars per day have been seen.

If the Lao Cai yard were rendered unserviceable, the freight cars moving from China would have to be handled at Ho-k'ou and Liu-tiao-pan on the Chinese side of the border. These two yards have a combined capacity of about 180 cars. Since May, they have been handling an average

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of 48 cars of all types or 24 freight cars per day. Presumably, they would have little trouble taking care of most of the North Vietnam freight traffic presently handled at Lao Cai, a matter of perhaps an additional 50 freight cars per day.

#### Alternatives to Rail Traffic

Interdiction of the rail line at Dong Dang would mean that all tonnage coming into the country from China (except petroleum) would have to move by truck. No major waterways are available in this part of the country. The road system leading directly out of China at this point (Route 1B) is adequate to handle only about 1,200 metric tons per day in the dry season and 400 metric tons per day in the wet season. Other roads leading from the main rail line in China could be used, but such use would require transshipment north of P'ing-hsiang and a longer truck haul.

If rail traffic could no longer move into North Vietnam on the northwest rail line through Lao Cai, it could be transshipped either to trucks for further movement by road or to barges for further movement on the Red River. A relatively high-capacity road (Route 4, with a capacity of 1,050 metric tons per day in the dry season and 350 metric tons in the wet season) leads out of Lao Cai parallel to

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the northwest rail line and the Red River. Only 50 to 75 trucks would be required daily to load the present volume of tonnage estimated to be entering North Vietnam through this border crossing point. Presumably, much of the tonnage presently coming in over this rail route is moved away from the rail line by truck at some point 30 to 40 miles inside the country. If the rail line were interdicted at Lao Cai, the trucks would merely load at the border instead.

The Red River presents an additional alternative to the rail line. The river meanders 200 miles southeastward from Yunnan Province in China to Hanoi. Its cargo capacity is estimated to be 1,000 tons per day during periods of high water (June-September) and 250 tons per day during the dry season. It thus has the capacity to handle the tonnage presently estimated to be entering the country over the northwest route. Although the vulnerability of watercraft on the river to air attack discourages the large-scale use of this route, it could be used as an alternate to the railroad and roads in this area.

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Highways

Air strikes against roads in the buffer zone would have to be intensive and continuous to appreciably reduce supply movements because the road network in this area is highly redundant and well-constructed. ~~Moving east to west, the~~ primary entry roads from China within the buffer zone are examined below.

Moving from east to west, the interdiction of Route 4 (paralleling the border) south of its junction with Route 416, could force the enemy to temporarily shift more of the heavier bulk traffic to Route 401; Route 401 could accommodate the increased traffic, but if both Routes 4 and 401 were interdicted, flows might be impeded west and south. A better candidate for interdiction is Route 415, which is accommodating more traffic currently than routes to the east. If successfully cut at Dinh Lap, this could temporarily deny entry from China and cut lateral flows on Route 4 in the buffer zone.

Moving westward, the next and most important entry corridor is the highway paralleling the P'ing-hsiang-Dong Dang rail line. A successful interdiction between Dong Dang and the border -- a distance of three miles -- would affect entering traffic on Route 1B and could deny traffic to Route 1A, where most of the heavy truck traffic observed by pilots during [ ] has occurred. The high, rugged terrain in this area would greatly complicate repair efforts.

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Since Routes 1A and 1B work in tandem with the Hanoi-Dong Dang rail line in moving supplies south, a successful interdiction would impinge on this activity also.

Route 3 south of Ching-hsi, China, is a primary road carrying considerable traffic this summer. Targeting the road at Cao Bang could impede import flows from the PRC via Route 3 and Route 172. Moving westward, we have evidence of substantial supply flows recently south on Route 2 out of China. However, the veritable spider web of roads in this area makes the chances for even temporary interdiction here remote. These roads connect at several points with the Hanoi-Lao Cai rail line, and supplies are moved on this combination mode. Routes 4 and 162 in the Ho-k'ou/Lao Cai area are a better target. Successful interdiction here could temporarily impede flows on both routes, which parallel the rail line. The most westerly primary access road -- Routes 6/132 -- is probably not used as a resupply route but could be if the entry roads at Ho-k'ou/Lao Cai were interdicted.

#### Coastal Shipping

The North Vietnamese coastline south of the Chinese border within the 25-mile buffer zone probably accommodates some transshipment points for goods entering the country from such Chinese ports as Pei-hai and Fang-ch'eng. Small craft can ply the unmined coastal waters in this area at night, thus degrading the possibilities of surveillance

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and destruction. Concerted efforts at identifying and striking coastal transshipment points could hamper such activities.

### Pipelines

There would be no special merit in attempting to interdict the new PRC-North Vietnam pipelines themselves within the buffer zone as opposed to attacking them at any points along their length further into North Vietnam. However, the basic line from P'ing-hsiang (PRC) feeds into two others at Dong Dang at an underground storage facility west of the town. Considerable damage could be done to the system at this junction. There are, in addition, some pumping stations within the buffer zone at Dong Dang, Ban Noc, Pac Keo, and Bang Mac which, if destroyed, would incapacitate the lines temporarily.

Any targeting of a pipeline or its accessories should take into account that the line itself is small, difficult to detect and hit, and easy and quick to repair. Add to this the fact that there are in the import network a total of three lines having an aggregate capacity of 3,000 tons daily -- treble Hanoi's entire petroleum requirements. Most pumping stations associated with the pipeline are mobile, can be replaced fairly easily, and are probably readily available in stock.

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### Economic Targets

The current US bombing program has not been directed at economic targets to any appreciable extent, and, in view of the small role that North Vietnam's industry plays in supporting the war, this has been a reasonable targeting practice. There are, however, some industrial installations which may represent valid targets for an expanded bombing effort. Although their destruction cannot be expected to produce untenable economic conditions, their loss may compound economic problems by creating additional shortages, may possibly increase import demands, or may create political or morale stress within North Vietnam -- to the extent that their destruction is viewed as the byproduct of Hanoi's current military policies. These targets are representative of examples of North Vietnam's small modern industry, and some, like the Thai Nguyen Iron and Steel Combine, under construction (and reconstruction) since 1960, represent long years of planning and mammoth investment of labor and materials, by Vietnamese standards.

### Iron and Steel

The Thai Nguyen combine is the largest single industrial complex in North Vietnam and, when completed was to represent a total investment of \$160 million. Plans called for an ultimate annual productive capacity of

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25X1

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25X1

250,000 to 300,000 tons of coke, 300,000 tons of pig iron, and 500,000 tons of crude steel. Construction of the complex was interrupted by bombing during ROLLING THUNDER, and output apparently never reached the stage of actual steelmaking. When the bombing was resumed in April 1972, operating main components included an ore sinter plant, a coke battery, a coke-chemical byproducts plant, and pig iron production from three blast furnaces.

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Regular photographic coverage of the complex since June shows the coke battery to be in probable continuous operation. Light damage to the coke-chemical byproducts plant and the lack of dismantling activity there suggest that the byproducts plant also is in service. This production activity indicates that a high priority is attached to at least the production of coke, most likely for foundry and metalworking operations in other parts of the country.

TOP SECRET

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25X1

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Fertilizer

Domestic output of chemical fertilizer is largely accounted for in three production facilities. The largest of these is the Lam Thao Superphosphate Plant at Phu Tho, which has a rated capacity of 100,000 to 120,000 tons per year of superphosphate. Two small plants at Van Dien (near Hanoi) and Hai Duong produce a low-grade chemical fertilizer (molten phosphorous process), each with an annual capacity of 15,000 to 20,000 tons per year. Beyond these facilities, North Vietnam has no serviceable producers of chemical fertilizer and must rely on imports, which, in 1971, amounted to about 330,000 tons. Each of the fertilizer plants mentioned above is known from photographic coverage to be at least in sporadic operation, and none of the plants has been damaged by bombing under

Machine Tools

The Hanoi Machine Tool Plant is the largest single machine-building installation in North Vietnam. It was built with Soviet assistance and put into operation in 1958. In early 1972, work was completed on an expansion project that added some 50% to total floorspace. Production is focused primarily on copies of Soviet multipurpose lathes and drill presses, but the plant also produces agricultural pumps and automotive parts. Although current production emphasis is not known, the plant's equipment

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could have been oriented to military or

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related requirements. To date, this installation has not sustained any damage. The remainder of North Vietnam's central machine-building capability resides in two significant but much smaller installations, the Tran Hung Dao Machine Tool Plant in Hanoi and the Duyen Hai Machine Plant in Haiphong. These two plants in the past have concentrated on production of diesel engines and agricultural machinery.

#### Electric Power

With 75% of North Vietnam's electric power generating capacity already nullified, there are few lucrative electric power facilities left for either initial strikes or worthwhile targets for restrikes. The most significant undamaged generating facility is the Hanoi Thermal Powerplant. This plant's capacity of 25,000 kilowatts (kw) represents roughly 10% of total generating capacity in the country. More importantly, however, it accounts for more than one-half the remaining serviceable capacity in the Hanoi-Haiphong power network. The Hanoi powerplant was bombed several times under [ ] but was never damaged severely. It is not an easily accessible target and is located in a high-density population area. Moreover, the plant is shielded on three sides by blast walls and photography shows the use of smoke screens as a further protective measure.

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TOP SECRET

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25X1

Another undamaged power facility is a diesel powerplant with an estimated capacity of 5,000 kw located on the grounds of the Haiphong East Thermal Powerplant, which was destroyed during ROLLING THUNDER. It is the largest known diesel powerplant in North Vietnam.

A possible candidate for restrike is the Bac Giang Thermal Powerplant. The plant apparently has been in limited operation since late July, despite bomb damage inflicted earlier. Photography indicates that current output at most does not exceed 6,000 kw.

Aside from the above generating facilities, there are no central generating facilities still serviceable in the Hanoi-Haiphong network. Hanoi and Haiphong each has about five small diesel plants situated about the cities, and remaining power supplies are generated by numerous independent diesel units distributed throughout the country.

#### Transport Repair Facilities

Prior to the start of US air operations against North Vietnam in 1965, there were three major railroad equipment repair shops in the country. The main one was at the Gia Lam Railroad Station/Yard and Car Repair Shop -- two miles north of Hanoi at the junction of the Hanoi-Haiphong and Hanoi-Dong Dang lines. This repair shop performed major repairs and overhauls but was severely damaged during

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25X1

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25X1

ROLLING THUNDER and was still being rebuilt in 1972. Other repair facilities are at the Hanoi Railroad Station and Classification Yard and Shops in the center of Hanoi -- never struck during either [ ] -- and 25X1  
at the Haiphong Railroad Yard near the port. Both of these are used for minor repairs, although a locomotive repair facility may exist at Hanoi.

As of 21 September, only the Haiphong Railroad Yard had been attacked (19 May and 12 July) during [ ] Post- 25X1  
strike photography has confirmed that the roof of the repair facility is missing and that several nearby buildings have been demolished. Since these attacks and other damage to bridges along the Haiphong line, there has been little rail traffic at the port, and it is likely the repair facilities are not in use.

Almost all of North Vietnam's capacity for the repair of railroad stock and equipment is now accounted for by the Hanoi Railroad Station and Classification Yard.

← Located in the heart of Hanoi, the facility includes two large locomotive repair shops, one railroad car repair shop, and one turntable. The extended loss of this facility would be a serious setback to North Vietnam and would require an increased rate of imports of transportation equipment to compensate for a reduced repair capability.

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Food-Processing Plants

In the general agricultural category, food-processing plants represent potential targets for causing some initial decline in the standard of living and complicating the regime's problems of maintaining public morale.

North Vietnam has at least four major canneries, numerous sugar mills, and about 14 major rice mills -- gifts of Communist China. The canneries are located in Hanoi, Haiphong, Son Tay, and Phu Tho. Bombing of these canneries will reduce the supply of canned fish, meat, and fruit. The sugar mills can be classified as local industry and are located in most provinces. The rice mills are located in Hanoi, Bac Giang, Viet Tri, Haiphong, Hai Duong, Hung Yen, Dap Can, Nam Dinh, Thai Binh, Ninh Binh, Ham Rong, Vinh, Ninh Giang, and Thanh Hoa. They have a total milling capacity of between 15% and 20% of the average annual rice production.

Command and Control

Damage to telecommunications facilities has thus far been confined to open wireline and microwave radio relay facilities. While there has been some dislocation in services, the overall communications posture of North Vietnam has not been significantly altered. There is no evidence that major high-frequency (HF) radio facilities having a military or governmental command and control function have

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25X1

been damaged, with the possible exception of an HF air defense communications facility at Bac Mai airfield.

It is highly unlikely that any level of bombing could wholly deprive North Vietnam of its capability to carry out -- in some way or another -- command communications of an essential nature. However, simultaneous attacks against the major HF radio facilities, particularly those in and around Hanoi, could cause significant temporary disruptions and introduce considerable confusion in both national and international communications for an extended period of time. At the very least, there would be considerable loss in communications efficiency as Hanoi moved to replace the costly equipment, much of which would have to be imported. North Vietnamese concern over the possible consequences of such a bombing program is suggested by the protective measures which have recently been undertaken at two major telecommunications installations near the capital. A blast wall reportedly has been completed for the secondary control building at Radio Hanoi, the principal domestic broadcast facility at Me Tri, and smoke cannisters have been installed (as a possible defense against "smart" bombs). The primary control building was already surrounded by a blast wall, and there is a bunkered alternate control area. Smoke cannisters have been added to the country's major international transmitter at Dai Mo, where blast walls had previously been built.

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25X1

TOP SECRET

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25X1

The Table lists several possible communications targets. The locations of these facilities are based primarily on photography. There is practically no agent intelligence reporting on the functions of these facilities, and <sup>direction</sup> HF <sup>funding</sup> (DF) techniques against any particular facility within the Hanoi area is impossible. Hanoi Radio Communications Station No. 3 is reported to be the Post, Telephone, and Telegraph Office and, as such, is associated with (or part of) the key Central Telegraph Bureau which handles both domestic and international traffic. The principal users of the HF radio facilities, such as those at Phu Coc, Dai Mo, and Son Dong, are the General Directorate of Post and Telecommunications, the Lao Dong (Communist) Party, and branches of the military services. Because of the close association between government, Party, and military communications, no single facility can be identified as being devoted solely to the requirements of any one part of Hanoi's command and control system.

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## Table

## Key Radio Communications Stations in North Vietnam

Name	Function
Dai Mo	Transmitting station for Radio Hanoi International Communication
Son Dong	Receiving station for Radio Hanoi International Communication
Lang Trouc	Transmitting station for international communication
Phu Coc	Hanoi Radio Communication Receiver
Bac Mai	Hanoi Radio Communication Station
Yen Hoa	Hanoi Radio Communication Station
Hanoi	Hanoi Communication Facility South
Hanoi	Ministry of Public Security Hanoi Radio Station No. 1
Hanoi	Hanoi Radio Communication Station No. 3 Also reported to be the Post, Telephone, and Telegraph Office (PTT)
Hanoi	Hanoi Radio Communication Station No. 8 This station has the responsibility for PTT offices, long distance telephone switchboard, and control facility for international radio communication
Chuc Son	Hanoi Radio Communication Station
Bac Mai South	Hanoi Radio Communication Station South

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Approved For Release 2004/06/14 : CIA-RDP80R01720R000400070003-4

25X1

25X1

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